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British grasses

The necessity of increasing the production of foodstuffs in the British Isles has brought about a considerable reduction in the area of grassland. To offset these reductions, efforts have been made to improve the remaining grassland in order that it may carry a correspondingly larger number of stock. With this in view ARMSTRONG,² of the School of Agriculture, Cambridge University, has prepared a comprehensive work on British grasses. The book is divided into two sections, the first being devoted to botany, the second to agriculture. In the botanical section is considered the morphology and "biology" (germination, pollination, and dissemination) of grasses, followed by a detailed description of the species. The author has distinguished the more common grasses by one key, or rather a synopsis, based upon foliage characters, and by another, based upon floral characters. These keys from the standpoint of technique leave much to be desired. They are not dichotomous nor are the characters uniformly contrasting, nor is there uniformity in the method of expression, the style shifting from phrase to sentence ("awn not exceeding palea" set against "awn exceeds palea"). The structure of the spikelet is clearly set forth and well illustrated by diagrams. The figures are nearly all original and in the main are very satisfactory for diagnostic purposes. Some of the half tones are smudgy, but the cuts from drawings are good.

The agricultural section deals with the species from the agronomic standpoint. The commercial grasses of the United Kingdom include about the same species that are used in the cool humid sections of the United States, that is, the states east of the Great Plains and north of Tennessee and Virginia. In this region one meadow grass, timothy, and one pasture grass, Kentucky bluegrass or June grass, stand out preeminently. Redtop (*Agrostis alba*) is important in moist and so-called acid soils, but does not approach the others in acreage or value. Orchard grass and meadow fescue are locally important but fall far behind redtop in acreage. All other grasses for permanent pasture or meadow are, on the basis of acreage and value, scarcely worth considering.

One of the first things the American agronomist wishes to know in consulting a work on British grasses is, what is the relative importance of the different species from the commercial standpoint as indicated by acreage under cultivation or by the value of the product? An answer to this question cannot easily be obtained from the work before us. Apparently there are several species of approximately equal importance. The moist cool climate of the British Isles is favorable for the growth of several species that do not thrive under the more trying climate of the northeastern United States. Besides the species mentioned as important in this country, the following are considered in the present volume in such a way as to give the impression that they are commercially valuable: meadow foxtail (*Alopecurus pratensis*), sweet-scented

² ARMSTRONG, S. F., British grasses and their employment in agriculture. 8vo. pp. viii+199. *figs.* 175. Cambridge University Press. 1917.

vernal grass (*Anthoxanthum odoratum*), yellow oat-grass (*Avena flavescens*), tall oat-grass (*Avena elatior* or, in the botanical section, *Arrhenatherum avenaceum*), crested dog's-tail (*Cynosurus cristatus*), sheep's fescue (*Festuca ovina*), red fescue (*F. rubra*), perennial rye-grass (*Lolium perenne*), Italian rye-grass (*L. italicum*), wood meadow-grass (*Poa nemoralis*), and rough-stalked meadow-grass (*P. trivialis*). All these species are advertised by our seedsmen, but only three, tall oat-grass and the rye-grasses, are used in the United States in more than an incidental way.

The common names are of interest. The species have for the most part retained the English names when grown in this country, but *Agrostis alba*, known in England as bent-grass, is called here redbtop; English fine bent-grass (*Agrostis vulgaris*) is called here Rhode Island bent; English cock's-foot is called here orchard grass; English smooth-stalked meadow-grass is called here Kentucky bluegrass or June grass; timothy in England has the alternative name cat's-tail grass. *Cynodon Dactylon*, our familiar southern pasture grass known in the United States as Bermuda grass and in the English West Indies as Bahama grass, is called in England creeping finger-grass. This assumes no agronomic importance there, as the climate is too cool and moist for its best development.

The author is director of the United Kingdom Seed Control Station, a fact reflected in the prominence given to data concerning the seed of grasses. There are two chapters devoted to the subject, one on the valuation and purchase of grass seeds, and one on the specification and compounding of grass seed mixtures. In the botanical section there are cuts illustrating the "seed" (usually the florets) of the commercial species and of the common weed seeds found as impurities in grass seed.

The work is a valuable résumé of British agrostology and should be in the hands of all interested in that subject. However, the problems of grass culture in America are so different from those considered by ARMSTRONG that agrostologists in this country will receive little aid. Our problems have to do with the cultivation of grasses under conditions practically unknown in the British Isles.—A. S. HITCHCOCK.

NOTES FOR STUDENTS

Biology of rusts.—Among recent publications on rusts, GASSNER's³ account of his extensive studies in Uruguay gives the first comprehensive picture of the grain rust vegetation of that part of the world. Although the investigations were mostly made in the neighborhood of Montevideo, the observations and

³ GASSNER, G., Die Getreideroste und ihr Auftreten im subtropischen östlichen Südamerika. Centralb. Bakt. II. 44: 305-381. 1915.

———, Untersuchungen über die Abhängigkeit des Auftretens der Getreideroste vom Entwicklungszustand der Nährpflanze und von äusseren Faktoren. *Ibid.* II. 44: 512-617. 1915.